



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,175	02/26/2004	Lee Desmond Capper	ATOTP0109US	9900
<div>7590 03/14/2007 Thomas W. Adams Renner, Otto, Boisselle & Sklar, LLP Nineteenth Floor 1621 Euclid Avenue Cleveland, OH 44115-2191</div>			<div>EXAMINER WONG, EDNA</div> <div>ART UNIT 1753 PAPER NUMBER</div>	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/14/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/789,175

Applicant(s)

CAPPER ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 11-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 43 and 44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :April 14, 2004; October 14, 2005; November 14, 2005.

Election/Restrictions

Applicant's election of Group I, claims **1-10, 43 and 44**, in the reply filed on January 4, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

The requirement is still deemed proper and is therefore made FINAL.

Accordingly, claims **11-42** are withdrawn from consideration as being directed to a non-elected invention.

Specification

The disclosure is objected to because of the following informalities:

page 10, line 26, the word "ro" should be amended to the word -- or --.

Appropriate correction is required.

Claim Objections

Claim 6 is objected to because of the following informalities:

Claim 6

line 3, the word "compound" should be amended to the word -- compounds --.

line 12, the word "compound" should be amended to the word -- compounds --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims **3-4, 6 and 43-44** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3

line 2, it appears that “a zinc-nickel alloy” is further limiting the zinc-nickel ternary or higher alloy as recited in claim 1, lines 1-2. However, it is unclear if it is. If it is not, then what is the relationship between the zinc-nickel alloy and the zinc-nickel ternary or higher alloy?

Claim 4

line 2, it appears that “a zinc-nickel alloy” is further limiting the zinc-nickel ternary or higher alloy as recited in claim 1, lines 1-2. However, it is unclear if it is. If it is not, then what is the relationship between the zinc-nickel alloy and the zinc-nickel ternary or higher alloy?

Claim 6

line 13, the definition of “n” is missing in the claim.

line 15, the definition of “n” is missing in the claim.

lines 19-20, the phrase “(wherein Z independently may be H, an alkali metal ion, or Z₂ may be an alkaline earth metal ion)” is indefinite.

Claim 43

lines 8-11, the phrase “***such as*** ethylenediamine or its methyl-substituted derivatives; propylenediamine or its methyl-substituted derivatives; diethylenetriamine or its methyl-substituted derivatives; and higher alkylene polyamines” is indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

I. Claims **1-4 and 7** are rejected under 35 U.S.C. 102(b) as being anticipated by **JP 6-116781 ('781)**.

JP '781 teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

(a) zinc ions (= Zn²⁺) [page 3, [0010]];

(b) nickel ions (= Ni²⁺) [page 3, [0010]]; and

(c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} , with the proviso that when the ionic species comprises Te^{+4} , the bath further comprises one or more additional ionic species selected from ions of Bi^{+3} , Sb^{+3} , Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} (= Sb_2O_3) [page 3, [0011]].

When the ionic species comprises one or more of Bi^{+3} or Sb^{+3} , the bath further comprises one or more additional ionic species selected from ions of Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} (= Fe^{2+} , Co^{2+} and Cr^{3+}) [page 3, [0010]; and page 4, Nos. 15-17].

The zinc ion and the nickel ion are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 3 wt% to about 25 wt% of the alloy (= 5-20 wt%) [page 2, [0009]].

The zinc ion and the nickel ion are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 8 wt% to about 22 wt% of the alloy (= 5-20 wt%) [page 2, [0009]].

The bath comprises an acidic pH (= pH of 0.5-6) [page 3, [0010]].

II. Claims **43** and **44** are rejected under 35 U.S.C. 102(b) as being anticipated by **JP 6-116781** ('781).

JP '781 teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

(a) zinc ions ($= \text{Zn}^{2+}$) [page 3,[0010]]; (b) nickel ions ($= \text{Ni}^{2+}$) [page 3, [0010]]; and (c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} , with the proviso that when the ionic species comprises Te^{+4} , the bath is free of a mixture of brighteners comprising both (i) reaction product of epihalohydrin with alkylene amines such as ethylenediamine or its methyl-substituted derivatives; propylenediamine or its methyl-substituted derivatives; diethylenetriamine or its methyl-substituted derivatives; and higher alkylene polyamines, and (ii) aromatic aldehydes ($= \text{Sb}_2\text{O}_3$) [page 3, [0011]].

The bath further comprises one or more additional ionic species selected from ions of Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} ($= \text{Fe}^{2+}$, Co^{2+} and Cr^{3+}) [page 3, [0010]].

III. Claims 1, 3-4 and 7 are rejected under 35 U.S.C. 102(b) as anticipated by JP 64-68488 ('488).

JP '488 teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

(a) zinc ions ($=$ from zinc sulfate); (b) nickel ions ($=$ from nickel sulfate); and (c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} , with the proviso that when the ionic species comprises Te^{+4} , the bath further

comprises one or more additional ionic species selected from ions of Bi^{+3} , Sb^{+3} , Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} (= Bi^{+3}) [abstract; and page 3, lines 3-14].

The zinc ion and the nickel ion are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 3 wt% to about 25 wt% of the alloy (= Ni content in a plating layer is regulated to 9-18 wt%) [abstract].

The zinc ion and the nickel ion are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 8 wt% to about 22 wt% of the alloy (= Ni content in a plating layer is regulated to 9-18 wt%) [abstract].

The bath comprises an acidic pH (= pH 1.6) [page 3, right column, line 11]].

IV. Claim **43** is rejected under 35 U.S.C. 102(b) as anticipated by **JP 64-68488** ('488).

JP '488 teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

(a) zinc ions (= from zinc sulfate);

(b) nickel ions (= from nickel sulfate); and

(c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} ,

with the proviso that when the ionic species comprises Te^{+4} , the bath is free of a mixture of brighteners comprising both (i) reaction product of epihalohydrin with alkylene amines such as ethylenediamine or its methyl-substituted derivatives;

propylenediamine or its methyl-substituted derivatives; diethylenetriamine or its methyl-substituted derivatives; and higher alkylene polyamines, and (ii) aromatic aldehydes (= Bi^{+3}) [abstract; and page 3, lines 3-14].

V. Claims **1-4 and 7** are rejected under 35 U.S.C. 102(b) as being anticipated by **Irie et al.** (US Patent No. 4,581,107).

Irie teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

(a) zinc ions (= Zn^{2+});

(b) nickel ions (= Ni^{2+}); and

(c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} , with the proviso that when the ionic species comprises Te^{+4} , the bath further comprises one or more additional ionic species selected from ions of Bi^{+3} , Sb^{+3} , Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} (= Sb^{3+}) [col. 2, lines 56-64].

When the ionic species comprises one or more of Bi^{+3} or Sb^{+3} , the bath further comprises one or more additional ionic species selected from ions of Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} (= Cr^{3+} and In^{3+}) [col. 2, line 61].

The zinc ion and the nickel ion are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 3 wt% to about 25 wt% of the alloy (= 10-13 wt%) [cols. 5-6, Table 3].

The zinc ion and the nickel ion are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 8 wt% to about 22 wt% of the alloy (= 10-13 wt%) [cols. 5-6, Table 3].

The bath comprises an acidic pH (= pH of 2) [cols. 5-6, Table 1].

VI. Claims **43** and **44** are rejected under 35 U.S.C. 102(b) as being anticipated by **Irie et al.** (US Patent No. 4,581,107).

Irie teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

(a) zinc ions (= Zn^{2+});

(b) nickel ions (= Ni^{2+}); and

(c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} , with the proviso that when the ionic species comprises Te^{+4} , the bath is free of a mixture of brighteners comprising both (i) reaction product of epihalohydrin with alkylene amines such as ethylenediamine or its methyl-substituted derivatives; propylenediamine or its methyl-substituted derivatives; diethylenetriamine or its methyl-substituted derivatives; and higher alkylene polyamines, and (ii) aromatic aldehydes (= Sb^{3+}) [col. 2, lines 56-64].

The bath further comprises one or more additional ionic species selected from ions of Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} (= Cr^{3+} and In^{3+}) [col. 2, line 61].

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims **1-4 and 7** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Wolski et al.** (US Patent No. 4,572,768).

Wolski teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

(a) zinc ions (= from zinc sulphate);

(b) nickel ions (= from nickel sulphate); and

(c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} ,

with the proviso that when the ionic species comprises Te^{+4} , the bath further comprises one or more additional ionic species selected from ions of Bi^{+3} , Sb^{+3} , Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} (= from potassium antimony tartrate) [col. 4, Example 3].

The zinc ion (= 20-100 g/l) and the nickel ion (= 1-70 g/l) are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 3 wt% to about 25 wt% of the alloy (*inherent*) [col. 4, Example 3].

The zinc ion (= 20-100 g/l) and the nickel ion (= 1-70 g/l) are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 8 wt% to about 22 wt% of the alloy (*inherent*) [col. 4, Example 3].

The bath comprises an acidic pH (= pH from 1.5-3.5) [col. 4, Example 3].

II. Claim 43 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Wolski et al.** (US Patent No. 4,572,768).

Wolski teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

- (a) zinc ions (= from zinc sulphate);
- (b) nickel ions (= from nickel sulphate); and
- (c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} , with the proviso that when the ionic species comprises Te^{+4} , the bath is free of a mixture of brighteners comprising both (i) reaction product of epihalohydrin with alkylene amines such as ethylenediamine or its methyl-substituted derivatives; propylenediamine or its methyl-substituted derivatives; diethylenetriamine or its methyl-substituted derivatives; and higher alkylene polyamines, and (ii) aromatic

aldehydes (= from potassium antimony tartrate) [col. 4, Example 3].

III. Claims 1-4, 8 and 10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Yanagawa et al.** (US Patent No. 4,877,496).

Yanagawa teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

(a) zinc ions (col. 4, lines 44-50);

(b) nickel ions (col. 4, lines 44-50); and

(c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} , with the proviso that when the ionic species comprises Te^{+4} , the bath further comprises one or more additional ionic species selected from ions of Bi^{+3} , Sb^{+3} , Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} (col. 2, lines 44-45).

The zinc ion and the nickel ion are present in the bath at concentrations (col. 3, Table 1) sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 3 wt% to about 25 wt% of the alloy (= 6.5%) [col. 7, lines 3 and 45].

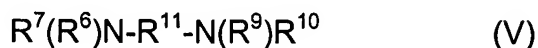
The zinc ion and the nickel ion are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 8 wt% to about 22 wt% of the alloy (= 6.5%) [col. 7, lines 3 and 45].

The bath comprises an alkaline pH (col. 2, line 10-12) and further comprises a

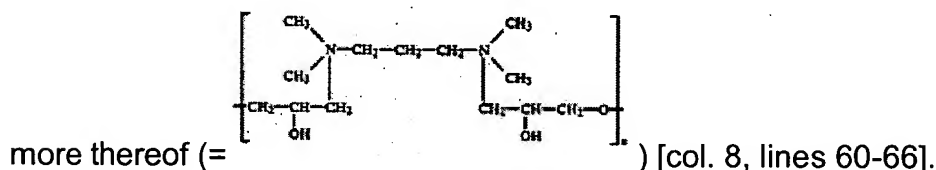
Art Unit: 1753

complexing agent (col. 4, line 52 to col. 5, line 15).

The complexing agent comprises an aliphatic amine, a polymer of an aliphatic amine, a compound represented by the formula



wherein R^7 , R^8 , R^9 and R^{10} are each independently alkyl or hydroxyalkyl groups provided that one or more of R^7 - R^{10} is a hydroxy alkyl group, and R^{11} is a hydrocarbylene group containing up to about 10 carbon atoms, or a mixture of two or



Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims **1-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **GB 2,104,920** ('920) in combination with **JP 06-116781** ('781).

GB '920 teaches an electroplating bath for depositing a zinc-nickel ternary or higher alloy, comprising:

(a) zinc ions (= from zinc chloride) [page 2, lines 22-28]; and

Art Unit: 1753

(b) nickel ions (= from nickel chloride hexahydrate) [page 2, lines 22-28].

The bath further comprises one or more non-ionogenic, surface active polyoxyalkylene compound (page 2, lines 78-85).

The one or more non-ionogenic surface active polyoxyalkylene compound comprises:

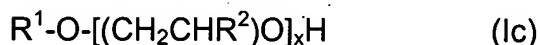
(i) one or more compound having a formula:



or



or



wherein R^1 is an aryl or alkyl group containing up to about 24 carbon atoms, R^2 is an alkyl group containing from 1 to about 4 carbon atoms, n is 2 or 3, and x is an integer between 2 and about 100;

(ii) one or more compound having a formula:



or



wherein R^3 = a C_1 - C_{18} branched or unbranched alkyl, alkylene or alkynyl group, or phenyl- O - $[R^5-O]_m$ - CH_2 -, in which m = 0-100 and R^5 is a C_1 - C_4 branched or unbranched alkylene; R^4 = C_1 - C_4 branched or unbranched alkylene; X = H, $-SO_2Z$, $-SO_3Z$, $-SO_4Z$,

Art Unit: 1753

-PO₄Z₂ (wherein Z independently may be H, an alkali metal ion, or Z₂ may be an alkaline earth metal ion) -NH₂, -Cl or -Br; Y is an aliphatic polyhydroxy group, an amine group, a polyamine group or a mercaptan group, and a is equal to or less than the number of active hydrogens in OH, -NH, NH₂ or -SH groups on the Y component; or

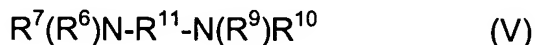
(iii) a mixture of two or more of (i) and/or (ii) [=
$$\begin{array}{c} \text{CH}_3-(\text{CH}_2)_x-\text{CH}_3 \\ | \\ \text{O}-(\text{CH}_2-\text{CH}_2\text{O})_n-\text{H} \end{array}$$
]

(page 2, lines 105-117).

The bath comprises an acidic pH (= pH of 4.7 to 8) [page 3, lines 103-115].

The bath comprises an alkaline pH (= pH of 4.7 to 8) [page 3, lines 103-115] and further comprises a complexing agent (page 3, lines 116-120).

The complexing agent comprises an aliphatic amine, a polymer of an aliphatic amine, a compound represented by the formula



wherein R⁷, R⁸, R⁹ and R¹⁰ are each independently alkyl or hydroxyalkyl groups provided that one or more of R⁷-R¹⁰ is a hydroxy alkyl group, and R¹¹ is a hydrocarbylene group containing up to about 10 carbon atoms, or a mixture of two or more thereof (= Quadrol) [page 3, lines 120-128].

The electroplating bath of GB '920 differs from the instant invention because GB '920 does not disclose the following:

- a. Wherein the electroplating bath comprises (c) one or more ionic

Art Unit: 1753

species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} , with the proviso that when the ionic species comprises Te^{+4} , the bath further comprises one or more additional ionic species selected from ions of Bi^{+3} , Sb^{+3} , Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} , as recited in claim 1.

GB teaches that it has long been recognized that zinc-nickel alloy electrodeposits can provide excellent corrosion resistance to substrates, such as steel, to which they are applied (page 2, lines 10-19).

Like GB '920, JP '781 teaches the electroplating of zinc-nickel alloys on steel sheets. JP '781 teaches that to improve corrosion resistance and press workability of a steel by plating it at a prescribed current in a Zn-Ni alloy plating bath containing a trace amount of Sb (= Sb_2O_3) and controlling the shape of the plating (abstract; and page 3, [0011]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the bath described by GB '920 with wherein the electroplating bath comprises (c) one or more ionic species selected from ions of Te^{+4} , Bi^{+3} and Sb^{+3} because a Zn-Ni alloy plating bath containing a trace amount of Sb would have improved corrosion resistance and press workability of steel sheets as taught by JP '781 (abstract; and page 3, [0011]).

b. Wherein when the ionic species comprises one or more of Bi^{+3} or Sb^{+3} , the bath further comprises one or more additional ionic species selected from ions of Ag^{+1} ,

Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} , as recited in claim 2.

JP '781 teaches Sb^{+3} (= Sb_2O_3) [page 3, [0011]].

JP also teaches Zn-Ni, Zn-Ni-Co, Zn-Ni-Fe, Zn-Ni-Cr and Zn-Ni-Fe-Cr alloy systems (page 2, [0009]; and page 4, Nos. 15-17).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the bath described by GB '920 with wherein the bath further comprises one or more additional ionic species selected from ions of Ag^{+1} , Cd^{+2} , Co^{+2} , Cr^{+3} , Cu^{+2} , Fe^{+2} , In^{+3} , Mn^{+2} , Mo^{+6} , P^{+3} , Sn^{+2} and W^{+6} because Zn-Ni-Co, Zn-Ni-Fe, Zn-Ni-Cr and Zn-Ni-Fe-Cr alloy systems are also suitable in improving the corrosion resistance and press workability of steel sheets as taught by JP '(page 2, [0009]; page 3, [0010]; and page 4, Nos. 15-17).

c. Wherein the zinc ion and the nickel ion are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 3 wt% to about 25 wt% of the alloy, as recited in claim 3.

d. Wherein the zinc ion and the nickel ion are present in the bath at concentrations sufficient to deposit a zinc-nickel alloy comprising a nickel content from about 8 wt% to about 22 wt% of the alloy, as recited in claim 4.

JP '781 teaches that a nickel content of 5-20 wt% is desirable (page 2, [0009]).

II. Claims 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable

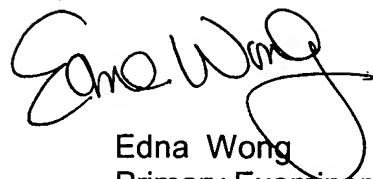
over **GB 2,104,920** ('920) in combination with **JP 06-116781** ('781).

GB '920 and JP '781 are as applied for the reasons as discussed above and incorporated herein.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Edna Wong
Primary Examiner
Art Unit 1753

EW
March 10, 2007